CLAIMS

1. Method in a digital communication system for transmitting a modulated bit stream comprising user data and dummy data, wherein the modulated user data is represented by symbols from a symbol alphabet M, the modulated dummy data is represented by a symbol m_0, the method is **characterised by** the steps of:

   (a)- generating (601a) symbols $q_0,..,q_j$ randomly from a predefined symbol alphabet Q being a subset of the symbol alphabet M,

   (b)- scrambling (602a) the bit stream by performing bitwise modulo-2 addition between the modulated bit stream and the randomly generated symbols $q_0,..,q_j$ from Q, and

   (c)- transmitting (603a) said scrambled bit stream, wherein the predefined symbol alphabet Q is defined so that the transmit power level of the dummy data is substantially lower than the transmit power level of the user data.

2. Method in a digital communication system for receiving a bit stream **characterised in** that the bit stream is transmitted and scrambled in accordance with claim 1, the method comprises the steps of:

   (d)- generating (601b) symbols $q_0,..,q_j$ randomly from the symbol alphabet Q in synchronisation with the transmitter of the received bit stream, and

   (e)- scrambling (602b) the received bit stream in order to recreate estimated message symbols from symbol alphabet M by performing bitwise modulo-2 addition between the received bit stream and the randomly generated symbols $q_0,..,q_j$ from Q.

3. Method according to any of claims 1 and 2, wherein the bit stream is modulated with Quadrature Amplitude Modulation (QAM).

4. Method according to claim 3, wherein the QAM is 16-QAM.

5. Method according to any of claims 1 or 4, wherein Q comprises four message points $\{q_0, q_1, q_2, q_3\}$ representing signal vectors $\{s_0, s_1, s_2, s_3\}$, wherein the length of all of the signal vectors is equal, i.e., $\|s_0\| = \|s_1\| = \|s_2\| = \|s_3\|$ and the angle increment from s_0 to s_1, s_1 to s_2, s_2 to s_3 and s_3 to s_0, respectively is 90 degrees.

6. Method according to claim 5, wherein Q comprises the four innermost message points of the symbol alphabet M.

7. Method according to any of previous claims, wherein the randomly generated symbols from Q is generated by applying a pseudo-random binary sequence generator to a lookup table wherein the symbol alphabet Q and m_0 are stored.

8. Method according to any of previous claims, wherein the modulated dummy data m_0 is consistently represented by zeros or consistently represented by ones.

9. Method according to any of previous claims 1-8, wherein the method is applied on VDSL.

10. A computer program product directly loadable into the internal memory of a computer within a mobile station or a base station transceiver in a communication system, comprising the software code portions for performing the steps of any of claims 1-9.

11. A computer program product stored on a computer usable medium, comprising readable program for causing a computer, within a mobile station or a base station transceiver in a communication system, to control an execution of the steps of any of the claims 1-9.

12. Transmitter (400) in a digital communication system comprising means for transmitting a modulated bit stream comprising user data and dummy data, wherein the modulated user data is represented by

symbols from a symbol alphabet M, the modulated dummy data is represented by a symbol m_0, **characterised by** means (401, 402) for generating symbols $q_0,..,q_j$ randomly from a predefined symbol alphabet Q being a subset of M, means for scrambling the bit stream by performing bitwise modulo-2 addition between the modulated bit stream and the randomly generated symbols $q_0,..,q_j$ from Q, and means for transmitting said scrambled bit stream, wherein the predefined symbol alphabet Q is defined so that the transmit power level of the dummy data is substantially lower than the transmit power level of the user data.

13. Receiver (404) in a digital telecommunication system comprising means for receiving a bit stream **characterised in** that the bit stream is transmitted and scrambled by a transmitter in accordance with claim 10, the receiver further comprises means (405,406) for in synchronisation with the transmitter (400) of the received bit stream generating symbols $q_0,..,q_j$ randomly from the symbol alphabet Q, and means for scrambling the received bit stream by performing bitwise modulo-2 addition between the received bit stream and the randomly generated symbols $q_0,..,q_j$ from Q in order to recreate estimated message symbols from symbol alphabet M.

14. Transmitter (400) according to claim 12 or receiver (404) according to claim 13, wherein the bit stream is modulated with Quadrature Amplitude Modulation (QAM).

15. Transmitter (400) or receiver (404) according to claim 14, wherein the QAM is 16-QAM.

16. Transmitter (400) or receiver (404) according to any of claims 12-15, wherein Q comprises four message points $\{q_0, q_1, q_2, q_3\}$ representing signal vectors $\{s_0, s_1, s_2, s_3\}$, wherein the length of all of the signal vectors is equal, i.e., $\|s_0\| = \|s_1\| = \|s_2\| = \|s_3\|$ and the angle increment from s_0 to s_1, s_1 to s_2, s_2 to s_3 and s_3 to s_0 respectively is 90 degrees.

17. Transmitter (400) or receiver (404) according to claim 16, wherein Q comprises the four innermost message points of the symbol alphabet M.

18. Transmitter (400) or receiver (404) according to any of previous claims 12-17, wherein the randomly generated symbols from Q is generated by applying a pseudo-random binary sequence generator (401;405) to a lookup table (402;406) wherein the symbol alphabet Q and m_0 are stored.

19. Transmitter (400) or receiver (404) according to any of previous claims 12-18, wherein the modulated dummy data m_0 is consistently represented by zeros or consistently represented by ones.

20. Transmitter (400) or receiver (404) according to any of previous claims 12-19, wherein the transmitter (400) or receiver (404) is applied on VDSL.

21. Transceiver in a digital communication system **characterised in** that it comprises the transmitter according to any of claims 11, 13-18 and the receiver according to any of claims 12-18.